

CLAIMS

1. Transgenic non-human animal, preferably a knock-in mouse, having a missense mutation in the  $\alpha$ 4- or  $\beta$ 2-subunit of the neuronal nicotinic acetylcholine receptor (nAChr).  
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2. Animal of claim 1, having the missense mutation V287L or V287M in the gene for the  $\beta$ 2-subunit.
- 10 3. Animal of claim 1, having the missense mutation 259-260ins, S252L, 766ins3 or T265I in  $\alpha$ 4-subunit of the nAChr receptor.
4. Animal of any one of claims 1 to 3 containing the missense mutation homozygously.  
15 5. Animal of any one of claims 1 to 3 containing the missense mutation heterozygously.
6. Targeting vector containing the following components operatively linked:
  - the genomic and/or cDNA sequence for a subunit of the, preferably human or murine, nicotinic acetylcholine receptor (nAChr) having a missense mutation in the  $\alpha$ 4- or  $\beta$ 2-subunit, or a part of said subunit, wherein said part has at least 20 the missense mutation in the  $\alpha$ 4- or  $\beta$ 2-subunit.
  - a selectable marker gene, and
  - optionally 2 recognition sequences for a recombinase, which flank the marker gene.
- 25 7. Targeting vector of claim 6, wherein the selectable marker is an antibiotic resistance gene.
8. Targeting vector of claim 6 or 7, wherein the recognition sequences are each loxP.

9. Targeting vector of one or more of claims 6 to 8, wherein the  $\beta$ 2-subunit has the missense mutation V287L or V287M.

5 10. Targeting vector of one or more of claims 6 to 8, wherein the  $\alpha$ 4-subunit has the missense mutation 259-260ins, S252L, 766ins3 or T265I.

11. Stem cell, preferably murine embryonic stem cell, containing a vector of one or more of claims 6 to 10.

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12. Screening method for the identification of compounds for the treatment of the human epilepsy syndrome, particularly familiar nocturnal frontal lobe epilepsy (ADNFLE), comprising the following steps:

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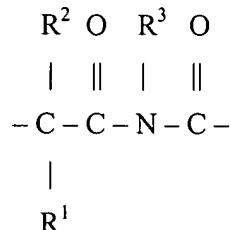
- a) providing an animal of any one of claims 1 to 5 and providing test compounds,
- b) administration of the test compounds to the animal,
- c) selection of a test compound resulting in alleviation or elimination of the symptoms of the epilepsy syndrome in the animal, and
- d) optionally repeating the steps a) to c) with a suitably modified form of the test compound chosen in c).

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13. Screening method of claim 12, wherein the test compounds are selected from the following groups:

- barbiturates, oxazolidindiones and succinimides and further groups having the following grouping as a common structural element:

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wherein R<sup>1</sup> and R<sup>2</sup> are alkyl or aryl residues and R<sup>3</sup> is H or an alkyl residue,

or

- derivatives of benzodiazepines, sultiam, Carbamazepin and valproic acid.

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14. Compound for the treatment of the human epilepsy syndrome, preferably of ADNFLE, which has been identified by the method of claim 12 or 13.
15. Pharmaceutical composition having a therapeutically effective dose of one or more compounds of one or more of claims 12 to 14 and a pharmaceutically acceptable carrier.
16. Use of the composition of claim 15 for the treatment of the human epilepsy syndrome, preferably ADNFLE.

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